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Characterizing Cool Giant Planets in Reflected Light

While the James Webb Space Telescope will detect and characterize extrasolar planets by transit and direct imaging, a new generation of telescopes will be required to detect and characterize extrasolar planets by reflected light imaging. NASA's WFIRST space telescope, now in development, will image dozens of cool giant planets at optical wavelengths and will obtain spectra for several of the best and brightest targets. This mission will pave the way for the detection and characterization of terrestrial planets by the planned LUVOIR or HabEx space telescopes. In my presentation I will discuss the challenges that arise in the interpretation of direct imaging data and present the results of our group's effort to develop methods for maximizing the science yield from these planned missions.